United Nations FCCC/IDR.6/GRC

Framework Convention on Climate Change

Distr.: General
17 February 2015

English only

# Report of the technical review of the sixth national communication of Greece

Parties included in Annex I to the Convention are requested, in accordance with decision 9/CP.16, to submit a sixth national communication to the secretariat by 1 January 2014. In accordance with decision 7/CMP.8, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol shall include in their sixth national communication supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. In accordance with decision 15/CMP.1, these Parties shall start reporting the information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention for the first year of the commitment period. This includes supplementary information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol.

This report presents the results of the technical review of the sixth national communication and supplementary information under the Kyoto Protocol of Greece conducted by an expert review team in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention" and the "Guidelines for review under Article 8 of the Kyoto Protocol".

GE.15-02676 (E)

*1502676*

Please recycle

# Contents


| | | *Paragraphs* | *Page* |
|---|---|---|---|
| I. | Introduction and summary | 1–10 | 3 |
| | A. Introduction | 1–5 | 3 |
| | B. Summary | 6–10 | 3 |
| II. | Technical review of the reported information in the national communication and supplementary information under the Kyoto Protocol | 11–112 | 6 |
| | A. Information on greenhouse gas emissions and national circumstances relevant to greenhouse gas emissions and removals, including other elements related to the Kyoto Protocol | 11–25 | 6 |
| | B. Policies and measures, including those in accordance with Article 2 of the Kyoto Protocol | 26–67 | 10 |
| | C. Projections and the total effect of policies and measures, including information on supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol | 68–87 | 18 |
| | D. Provision of financial resources and technology transfer to developing country Parties, including information under Articles 10 and 11 of the Kyoto Protocol | 88–97 | 23 |
| | E. Vulnerability assessment, climate change impacts and adaptation measures | 98–102 | 25 |
| | F. Research and systematic observation | 103–108 | 28 |
| | G. Education, training and public awareness | 109–112 | 29 |
| III. | Summary of reviewed supplementary information under the Kyoto Protocol | 113–116 | 30 |
| | A. Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol | 113–114 | 30 |
| | B. Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol | 115–116 | 31 |
| IV. | Conclusions and recommendations | 117–128 | 31 |
| V. | Questions of implementation | 129 | 34 |
| Annex | | | |
| | Documents and information used during the review | | 35 |

# I. Introduction and summary

## A. Introduction

1. For Greece, the Convention entered into force on 2 November 1994 and the Kyoto Protocol on 16 February 2005. Under the Convention, Greece made a commitment to contribute to the joint European Union (EU) economy-wide emission reduction target of 20.0 per cent by 2020 below the 1990 level. Within the burden-sharing agreement of the EU for meeting commitments under the Kyoto Protocol, Greece committed itself to limiting the growth in its greenhouse gas (GHG) emissions to 25.0 per cent in relation to the base year level[1] during the first commitment period, from 2008 to 2012. For the second commitment period of the Kyoto Protocol, from 2013 to 2020, Greece committed to contributing to the joint EU target of reducing its GHG emissions by 20.0 per cent below the base year level.

2. This report covers the in-country technical review of the sixth national communication (NC6) of Greece, coordinated by the secretariat, in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention" (decision 23/CP.19) and the "Guidelines for review under Article 8 of the Kyoto Protocol" (decision 22/CMP.1).

3. The review took place from 29 September to 4 October 2014 in Athens, Greece, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Ms. Ulla Jennische (Sweden), Mr. Hengsi Wilson Lin (Singapore), Mr. Reed Schuler (United States of America) and Mr. Jongikhaya Wit (South Africa). The review was coordinated by Mr. Daniel Hooper (secretariat).

4. During the review, the expert review team (ERT) reviewed each section of the NC6. The ERT also reviewed the supplementary information provided by Greece as a part of the NC6 in accordance with Article 7, paragraph 2, of the Kyoto Protocol. In addition, the ERT reviewed the information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, which was provided by Greece in its 2013 annual submission and previous submissions, and elaborated further in its 2014 annual submission under Article 7, paragraph 1, of the Kyoto Protocol.

5. In accordance with decisions 23/CP.19 and 22/CMP.1, a draft version of this report was communicated to the Government of Greece, which provided comments that were considered and incorporated, as appropriate, with revisions into this final version of the report.

## B. Summary

6. The ERT conducted a technical review of the information reported in the NC6 of Greece in accordance with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on

[1] "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for carbon dioxide, methane and nitrous oxide, and 1995 for perfluorocarbons, hydrofluorocarbons and sulphur hexafluoride. The base year emissions include emissions from sectors/source categories listed in Annex A to the Kyoto Protocol.

national communications" (hereinafter referred to as the UNFCCC reporting guidelines on NCs). Some of the supplementary information required by decision 15/CMP.1, under Article 7, paragraph 2, of the Kyoto Protocol[2] is not provided in the NC6 (see para. 114 below). The supplementary information on the minimization of adverse impacts referred to in paragraph 4 above is complete and transparent.

7. Greece considered some of the recommendations provided in the report of the in-depth review of its fifth national communication (NC5).[3] During the review, the Party provided further relevant information as follows:

(a) Information on what "new and additional" financial resources it has provided pursuant to Article 4, paragraph 3, of the Convention and clarification on how it has determined such resources as being "new and additional";

(b) Information on its activities under the World Climate Programme, the International Geosphere–Biosphere Programme and the Intergovernmental Panel on Climate Change (IPCC);

(c) Information on how it believes its policies and measures (PaMs) are modifying long-term trends in anthropogenic GHG emissions and removals in accordance with the objective of the Convention;

(d) Information on PaMs by sector and by gas;

(e) Information on its projections scenarios, including the estimated impacts of PaMs, as well as modelling assumptions and conditions.

### 1. Completeness and transparency of reporting

8. Gaps and issues related to the reported information identified by the ERT are presented in table 1 below.

### 2. Timeliness

9. The NC6 was submitted on 31 December 2013, before the deadline of 1 January 2014 mandated by decision 9/CP.16. The ERT commends Greece for the timeliness of its submission.

### 3. Adherence to the reporting guidelines

10. The information reported by Greece in its NC6 is mostly in adherence to the UNFCCC reporting guidelines on NCs as per decision 4/CP.5 (see table 1).

[2] Decision 15/CMP.1, annex, chapter II.

[3] FCCC/IDR.5/GRC.

Table 1
**Assessment of completeness and transparency issues of reported information in the sixth national communication of Greece**[a]

| *Sections of national communication* | *Completeness* | *Transparency* | *Reference to paragraphs* | *Supplementary information under the Kyoto Protocol* | *Completeness* | *Transparency* | *Reference to paragraphs* |
|---|---|---|---|---|---|---|---|
| Executive summary | Complete | Transparent | | National systems | Complete | Transparent | |
| National circumstances | Complete | Transparent | | National registries | Complete | Transparent | |
| Greenhouse gas inventory | Complete | Transparent | | Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 | Complete | Transparent | |
| Policies and measures (PaMs) | Complete | Mostly Transparent | 27, 29 | PaMs in accordance with Article 2 | Complete | Transparent | |
| Projections and total effect of PaMs | Complete | Partially Transparent | 70–72 | Domestic and regional programmes and/or arrangements and procedures | Complete | Transparent | |
| Vulnerability assessment, climate change impacts and adaptation measures | Complete | Transparent | | Information under Article 10 | Complete | Transparent | |
| Financial resources and transfer of technology | Mostly complete | Mostly Transparent | 89, 94 | Financial resources | Mostly complete | Transparent | 89 |
| Research and systematic observation | Mostly complete | Transparent | 103, 104 | Minimization of adverse impacts in accordance with Article 3, paragraph 14 | Complete | Transparent | |
| Education, training and public awareness | Complete | Transparent | | | | | |

[a] A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in the chapter on conclusions and recommendations

# II. Technical review of the reported information in the national communication and supplementary information under the Kyoto Protocol

## A. Information on greenhouse gas emissions and national circumstances relevant to greenhouse gas emissions and removals, including other elements related to the Kyoto Protocol

### 1. Information on relevant national circumstances

11. In its NC6, Greece has provided a detailed and concise description of the national circumstances and elaborated on the framework legislation and key policy documents on climate change. Further information on the review of the institutional and legislative arrangements for the coordination and implementation of PaMs is provided in chapter II.B below.

12. In its NC6, Greece provided information on its government structure, preparation of its national communications (NCs), population, geographic profile, climate profile, economic profile, transportation, energy system and waste. While the Greek energy system section of the NC6 is comprehensive, the ERT noted that providing additional information, such as the energy market structure and prices, would increase the transparency of the reported information. Therefore, Greece may consider including such information in its next NC.

13. The ERT noted that during the period 1990–2012, Greece's population and gross domestic product (GDP) increased by 7.3 and 33.3 per cent, respectively, while GHG emissions per GDP decreased by 21.7 per cent. The GHG emissions per capita decreased by 1.4 per cent. Table 2 illustrates the national circumstances of Greece by providing some indicators relevant to GHG emissions and removals.

Table 2
**Indicators relevant to greenhouse gas emissions and removals for Greece**

| | *1990* | *2000* | *2005* | *2010* | *2011* | *2012* | *Change 1990–2012 (%)* | *Change 2011–2012 (%)* |
|---|---|---|---|---|---|---|---|---|
| Population (million) | 10.34 | 10.92 | 11.09 | 11.15 | 11.12 | 11.09 | 7.3 | −0.3 |
| GDP (2005 USD billion using PPP) | 175.97 | 221.81 | 270.36 | 271.35 | 252.07 | 234.49 | 33.3 | −7.0 |
| TPES (Mtoe) | 21.44 | 27.09 | 30.25 | 27.61 | 26.75 | 26.55 | 23.8 | −0.7 |
| GHG emissions without LULUCF (kt $CO_2$ eq) | 104 935.53 | 126 587.59 | 135 319.57 | 117 885.72 | 114 737.26 | 110 994.06 | 5.8 | −3.3 |
| GHG emissions with LULUCF (kt $CO_2$ eq) | 102 821.25 | 124 580.10 | 132 641.13 | 115 031.18 | 111 806.15 | 108 128.51 | 5.2 | −3.3 |
| GDP per capita (2005 USD thousand using | 17.02 | 20.31 | 24.38 | 24.34 | 22.67 | 21.14 | 24.2 | −6.7 |

| | 1990 | 2000 | 2005 | 2010 | 2011 | 2012 | Change 1990–2012 (%) | Change 2011–2012 (%) |
|---|---|---|---|---|---|---|---|---|
| PPP) | | | | | | | | |
| TPES per capita (toe) | 2.07 | 2.48 | 2.73 | 2.48 | 2.41 | 2.39 | 15.5 | −0.8 |
| GHG emissions per capita (t $CO_2$ eq) | 10.15 | 11.59 | 12.20 | 10.57 | 10.32 | 10.01 | −1.4 | −3.0 |
| GHG emissions per GDP unit (kg $CO_2$ eq per 2005 USD using PPP) | 0.60 | 0.57 | 0.50 | 0.43 | 0.46 | 0.47 | −21.7 | 2.2 |

*Sources*: (1) GHG emission data: Greece's 2014 GHG inventory submission, version 2.1; (2) Population, GDP and TPES data: International Energy Agency.

*Note*: The ratios per capita and per GDP unit are calculated relative to GHG emissions without LULUCF; the ratios are calculated using the exact (not rounded) values and may therefore differ from a ratio calculated with the rounded numbers provided in the table.

*Abbreviations*: GDP = gross domestic product, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, PPP = purchasing power parity, TPES = total primary energy supply.

## 2. Information on the greenhouse gas inventory, emissions and trends

14. Greece has provided a summary of information on GHG emission trends for the period 1990–2011. This information is fully consistent with the 2013 national GHG inventory submission. Summary tables, including trend tables for emissions in carbon dioxide equivalent ($CO_2$ eq) (given in the common reporting format tables), are provided in an annex to the NC6. During the review, the ERT took note of the 2014 annual submission. To reflect the most recently available data, the Party's 2014 annual inventory data have been used as the basis for discussion in this report.

15. Total GHG emissions[4] excluding emissions and removals from land use, land-use change and forestry (LULUCF) increased by 5.8 per cent between 1990 and 2012, whereas total GHG emissions including net emissions or removals from LULUCF increased by 5.2 per cent over the same period. During the period 1990–2000, the increase in GHG emissions was mainly owing to sustained economic growth. Between 2000 and 2007, the annual GHG emission growth rate (approximately 0.5 per cent) was significantly lower than both the annual growth rate of gross inland energy consumption (approximately 1.9 per cent) and GDP annual growth rate (approximately 4.2 per cent). GHG emissions have been decreasing in Greece since 2008, mostly owing to the economic recession.

16. Total $CO_2$ emissions (without LULUCF) increased by 9.0 per cent between 1990 and 2012, owing mainly to an increase in electricity production, as well as an increase in energy consumption in the residential sector. Total methane ($CH_4$) emissions (without LULUCF) decreased by 8.5 per cent between 1990 and 2012, owing mainly to introducing better methods of solid waste disposal on land, including increased recycling rates and biogas capture. Total nitrous oxide ($N_2O$) emissions (without LULUCF) decreased by 33.4 per cent between 1990 and 2012, owing mainly to new agricultural practices that affected

[4] In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of $CO_2$ eq excluding land use, land-use change and forestry, unless otherwise specified.

the use of synthetic nitrogen fertilizers. Total fluorinated gases (F-gases) increased by 263.5 per cent between 1990 and 2012, resulting from replacing chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) (ozone-depleting substances) in cooling, as well as extending the application of F-gases in modern technologies, especially in cooling equipment (hydrofluorocarbons (HFCs)), electronics (sulphur hexafluoride ($SF_6$)) and some specialized manufacturing processes (low-energy windows, fire extinguishers, propellants for aerosols and expanding agents).

17. An analysis of the drivers of GHG emission trends in each sector is provided in chapter II.B below. Table 3 provides an overview of GHG emissions by sector from 1990 to 2012.

Table 3
**Greenhouse gas emissions by sector in Greece, 1990–2012**

| | *GHG emissions (kt $CO_2$ eq)* | | | | | *Change (%)* | | *Share[a] by sector (%)* | |
|---|---|---|---|---|---|---|---|---|---|
| *Sector* | *1990* | *2000* | *2010* | *2011* | *2012* | *1990–2012* | *2011–2012* | *1990* | *2012* |
| 1. Energy | 76 726.07 | 96 418.08 | 92 496.99 | 91 677.50 | 87 257.74 | 13.7 | –4.8 | 73.1 | 78.6 |
| A1. Energy industries | 43 159.05 | 54 832.24 | 52 222.44 | 54 026.37 | 54 698.94 | 26.7 | 1.2 | 41.1 | 49.3 |
| A2. Manufacturing industries and construction | 9 215.08 | 9 784.65 | 6 763.56 | 5 312.60 | 5 533.38 | –40.0 | 4.2 | 8.8 | 5.0 |
| A3. Transport | 14 493.45 | 18 826.86 | 22 272.45 | 19 803.09 | 16 097.84 | 11.1 | –18.7 | 13.8 | 14.5 |
| A4.–A5. Other | 8 600.60 | 11 463.78 | 9 846.33 | 11 097.55 | 9 390.67 | 9.2 | –15.4 | 8.2 | 8.5 |
| B. Fugitive emissions | 1 257.89 | 1 510.56 | 1 392.22 | 1 437.89 | 1 536.91 | 22.2 | 6.9 | 1.2 | 1.4 |
| 2. Industrial processes | 10 605.49 | 13 849.43 | 10 591.29 | 8 720.81 | 9 606.76 | –9.4 | 10.2 | 10.1 | 8.7 |
| 3. Solvent and other product use | 308.34 | 306.61 | 316.17 | 316.41 | 318.47 | 3.3 | 0.7 | 0.3 | 0.3 |
| 4. Agriculture | 11 407.60 | 10 019.45 | 9 433.40 | 9 137.12 | 9 075.85 | –20.4 | –0.7 | 10.9 | 8.2 |
| 5. LULUCF | –2 114.28 | –2 007.49 | –2 854.54 | –2 931.11 | –2 865.55 | 35.5 | –2.2 | NA | NA |
| 6. Waste | 5 888.03 | 5 994.02 | 5 047.86 | 4 885.43 | 4 735.23 | –19.6 | –3.1 | 5.6 | 4.3 |
| **GHG total with LULUCF** | **102 821.25** | **124 580.10** | **115 031.18** | **111 806.15** | **108 128.51** | **5.2** | **–3.3** | **NA** | **NA** |
| **GHG total without LULUCF** | **104 935.53** | **126 587.59** | **117 885.72** | **114 737.26** | **110 994.06** | **5.8** | **–3.3** | **100.0** | **100.0** |

*Source*: Greece's 2014 GHG inventory submission, version 2.1 (for GHG emission data).

*Note*: The changes in emissions and the share by sector are calculated using the exact (not rounded) values and may therefore differ from values calculated with the rounded numbers provided in the table.

*Abbreviations*: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, NA= not applicable.

[a] The shares of sectors are calculated relative to GHG emissions without LULUCF; for the LULUCF sector, the negative values indicate the share of GHG emissions that was offset by GHG removals through LULUCF.

## 3. National system

18. Greece provided in its NC6 a description of how its national system is performing the general and specific functions defined in the guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol (decision 19/CMP.1). The description

includes all the elements mandated by decision 15/CMP.1. The ERT took note of the review of the changes to the national system as reflected in the report of the individual review of the GHG inventory of Greece submitted in 2013, namely that the entity responsible for compiling the LULUCF section of the inventory under the Convention and its Kyoto Protocol has been changed to the National Technical University of Athens from the General Directorate for the Development and Protection of Forests and Natural Environment of the Ministry for the Environment, Energy and Climate Change (MEECC).

19. During the review, Greece provided additional information on the national system, elaborating on upcoming changes to the national system as a result of the restructuring of MEECC. A new directorate and new sections will be established, each with defined responsibilities with regard to the national system. Greece also informed the ERT that the circular 918/21-4-2008, which forms the basis for the legal framework for the national system, is being updated to reflect these changes.

### 4. National registry

20. In its NC6, Greece has provided information on the national registry in accordance with the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1. The ERT took note of the review of the changes to the national registry as reflected in the report of the individual review of the GHG inventory of Greece submitted in 2013, namely that the functions of the national registry have been centralized into a single EU registry. The ERT noted that the EU has centralized the European Union Emissions Trading System (EU ETS) operations of all member States into a single EU registry operated by the European Commission and called the Consolidated System of European Union Registries (CSEUR). The CSEUR is a consolidated platform which implements the national registries in a consolidated manner and was developed together with the new EU registry.

21. During the review, Greece provided additional information in the form of common readiness documentation and specific readiness documentation for the national registry of the EU and all consolidating national registries, which elaborated on the description of the consolidated registry. Greece highlighted that the documentation was confidential in nature, and that it had separately submitted the documentation with its 2013 national inventory report (NIR). The ERT notes that the 2013 annual review report had concluded that the Party's national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol.

### 5. Domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol

22. Greece has reported in its NC6 comprehensive and well-organized information on domestic and regional programmes and legislative arrangements and procedures related to the Kyoto Protocol. The overall responsibility for climate change policymaking lies within MEECC, and a number of national institutions are involved in the implementation processes of such policies.

23. Implementation of its Kyoto Protocol is underpinned by Greece's second national climate change programme, which was adopted in 2002 (act 5/27.02.2003 of the Ministerial Council). The second national climate change programme defines the PaMs necessary for Greece to meet its target for the first commitment period of the Kyoto Protocol, which limits the increase of GHG emissions to 25.0 per cent over the period 2008–2012, compared to base year emissions. Under law 3017/2002, MEECC is designated as the governmental body responsible for the coordination of actions taken to meet Greece's commitments under its Kyoto Protocol. An interministerial committee has been set up with

responsibility for the initial formulation of climate change policy, as well as for the monitoring, evaluation, modification and completion of the second national programme on climate change. Final approval of all PaMs related to climate change is made by the Council of Ministers.

24. The in-depth review report of the NC5 highlighted that Greece should include information on how it is improving its provisions to make information on its legislative arrangements and enforcement and administrative procedures publicly accessible. The ERT noted that Greece has addressed this in its NC6 by discussing how information on its PaMs for the reduction of GHG emissions, GHG inventory and projections, legislative arrangements, and enforcement and administrative procedures, which are in place to meet the national commitments under its Kyoto Protocol, are publicly accessible. The ERT commends Greece for its improved reporting.

25. Greece provided a description of national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, and elected activities under Article 3, paragraph 4, of the Kyoto Protocol also contribute to the conservation of biodiversity and the sustainable use of natural resources. The 1975 Constitution of the Third Hellenic Republic (articles 24 and 77), law decree 86/1969 and laws 998/1979 and 3208/2003 constitute the legal framework for the protection and management of forest and other wooded areas. Forest law 3208/2003 stresses the principles of sustainability, conservation of biodiversity and multiple uses of forest lands. The law also requires special measures to be taken for the protection of landscape and conservation of biodiversity during management planning and utilization of forest ecosystems.

## B. Policies and measures, including those in accordance with Article 2 of the Kyoto Protocol

26. Greece has provided in its NC6 information on its package of PaMs implemented, adopted and planned in order to fulfil its commitments under the Convention and its Kyoto Protocol.

### 1. Policies and measures related to implementation of commitments under the Convention

27. In its NC6, Greece reported on its PaMs adopted, implemented and planned in achieving its commitments under the Convention, as well as the policy context in which these PaMs operate. Greece reported comprehensive information on its policy context and national targets and objectives set to implement its commitments under the Convention, particularly on the involvement of the EU in establishing the national policy context, as well as determining specific targets and objectives. Greece provided information on PaMs by sector. However, the ERT noted that the presentation of PaMs by sector is not consistently subdivided by gas, although information about the gases affected by specific PaMs is presented in an overall summary table for the entire PaMs chapter in accordance with example table 1 of the UNFCCC reporting guidelines on NCs. To improve the transparency of reporting, the ERT recommends that Greece organize its PaMs by sector and by gas to reflect the information reported in the overall PaMs table in its next NC.

28. Greece has also provided in its NC6 some information related to its policy analysis for long-term action on reducing anthropogenic GHG emissions. For example, the NC6 presents the Greek Energy Roadmap to 2050, which conducts scenario analyses to help Greece evaluate potential PaMs for achievement of long-term goals.

29. In its NC6, Greece did not transparently provide information on all of the subject headings required by the UNFCCC reporting guidelines on NCs, including a short description, objectives, GHG affected, type of measure, status of implementation and implementing entities. For example, the "promotion of natural gas" PaM does not explain the implementing entity, and other reported PaMs, such as the "interconnection of islands", do not include short descriptions that would facilitate transparent understanding of their functions. During the review, Greece explained that the interconnection of islands with the mainland grid permits the islands to access the more efficient and less polluting mainland grid electricity. To improve the transparency of reporting, the ERT recommends that Greece provide clear information on all the subject headings required by the UNFCCC reporting guidelines on NCs in its next NC.

30. In Greece's NC6, the description of some PaMs did not specify what specific individual PaMs (if applicable), assumptions and conditions, and/or actions by Greece were considered when estimating its overall GHG emissions impact. For example, it was not transparent to the ERT whether the PaM entitled "the decommissioning of thermal power units" was a specific PaM implemented or adopted by Greece to achieve its GHG targets, or whether the assumptions and conditions under the 'with measures' scenario would result in the decommissioning of thermal power units. Another such example was the "promotion of natural gas" PaM, in which the ERT could not identify all the specific actions by Greece that were accounted for in this PaM. During the review, Greece explained that the implementation of the "promotion of natural gas" PaM was reported in 1996, as that was the year when natural gas was introduced into Greece's energy mix. To increase the transparency of reporting of each PaM, the ERT encourages Greece to clearly identify: (a) the estimation methods used for quantifying GHG emission impacts and (b) which specific individual PaMs and actions are included, as well as their dates of implementation, in its next NC.

31. In its NC6, Greece did not transparently link the textual description of some of its PaMs within the NC6 chapter "policies and measures and their effects" and the overall PaMs summary table. Specifically, the names of some of the PaMs and their headings within the NC6 PaMs chapter do not align with the names of the PaMs in the summary table. To increase the transparency of reporting, the ERT encourages Greece to explicitly link the tabular and textual information of its PaMs in its next NC.

32. In its NC6, Greece did not discuss how, in its reporting, it gives priority to PaMs that have the most significant impacts on GHG emissions and removals, although conclusions can be discerned from the GHG emission impact estimations of various PaMs. To increase transparency, the ERT encourages Greece to include an overview of the PaMs that have the most significant impacts on GHG emissions and removals in its next NC.

33. In its NC6, Greece did not present information related to the costs or the non-mitigation benefits of its PaMs. During the review, Greece presented some information related to analysis of non-mitigation benefits. For example, Greece stated that a number of its transport sector measures are projected to bring about urban air quality benefits. To increase the completeness of reporting, the ERT encourages Greece to provide information on costs and non-mitigation benefits of PaMs, where available, in its next NC.

34. Greece reported that to implement relevant EU commitments, it must assess the impacts of its activities that lead to greater levels of anthropogenic GHG emissions than would otherwise occur. However, in its NC6, Greece did not report on action taken to implement these commitments under Article 4.2(e)(ii) of the Convention, which requires that Parties identify and periodically update their own policies and practices that encourage these activities. To increase transparency, the ERT encourages Greece to report any such action taken to implement these commitments in its next NC.

35. The NC6 contains PaMs that are similar, in many regards, to those reported in the NC5, as some of them have been maintained over several years. However, it was not transparent whether some PaMs were existing PaMs or new PaMs since the NC5. In addition, where these PaMs have been maintained over time, Greece does not consistently discuss alterations to the PaMs or effects achieved since its NC5. To increase the transparency of reporting, the ERT encourages Greece to provide an overview of the alterations to its PaMs, or effects achieved, in its next NC.

36. Greece considered some of the recommendations provided in the in-depth review report of NC5. For example, Greece provided an overall summary table for the entire PaMs chapter in accordance with example table 1 of the UNFCCC reporting guidelines on NCs, which increased transparency. However, some recommendations provided in the last in-depth review report that remain relevant to the NC6 are for Greece to provide a transparent link between the textual descriptions of the PaMs for each sector with its PaMs summary table, and to provide more detailed information on how Greece believes its PaMs modify longer-term trends in emissions and removals.

### 2. Policy framework and cross-sectoral measures

37. The key frameworks related to climate change and energy are the second national climate change programme (as discussed in para. 23 above), the EU climate and energy package adopted in 2009, the second national energy efficiency action plan (2nd NEEAP) and the national renewable energy action plan (NREAP).

38. Regarding the EU climate and energy package, the main cross-sectoral PaMs contained in the legislation are the EU ETS and the EU effort-sharing decision (ESD) (decision 406/2009/EC). In operation since 2005, the EU ETS is a cap-and-trade system that covers all significant energy-intensive installations, which produce 40–45 per cent of the GHG emissions of the EU. The third phase of the EU ETS started in 2013 and now covers aircraft operations (2012), as well as $N_2O$ emissions from chemical industries, perfluorocarbon (PFC) emissions from aluminium production and $CO_2$ emissions from industrial processes (2013). The aim of the EU ETS is to decrease GHG emissions from the sectors covered by the EU ETS (ETS sectors) by 21.0 per cent below the 2005 level by 2020.

39. The ESD became operational in 2013 and covers sectors not covered by the EU ETS (non-ETS sectors), including transport (excluding aviation and international maritime transport), residential and commercial buildings, agriculture, waste and other sectors, together accounting for 55–60 per cent of the GHG emissions of the EU. The aim of the ESD is to decrease GHG emissions from the non-ETS sectors by 10.0 per cent below the 2005 level by 2020, and it includes annual binding and non-binding targets for 2013–2020, which are underpinned by the national policies and actions of EU member States.

40. The first national energy efficiency action plan (1st NEEAP) was prepared in December 2007 pursuant to the EU energy end-use efficiency and energy services directive 2006/32/EC. The 1st NEEAP outlines the PaMs that Greece needs to implement to fulfil the targets set by directive 2006/32/EC, namely reduction of 9.0 per cent of end-use energy consumption (16.46 TWh) for the period 2008–2016 compared to the average of 2001–2005. However, to ensure that the joint EU target of 20.0 per cent primary energy savings by 2020 is achieved, the European Commission adopted directive 2012/27/EU, which defines Greece's indicative national target of primary energy consumption for 2020 as 27.1 Mtoe.

41. The 2nd NEEAP, which was prepared in September 2011, further describes and evaluates the implemented, adopted and planned PaMs for the energy end-use sectors in Greece, focusing on residential, tertiary (public and private), non-ETS industries and

transport. Moreover, the 2nd NEEAP includes an extensive description of the energy savings achieved through the energy efficiency improvement measures identified in the 1st NEEAP. It also presents the progress in meeting the interim target for energy savings in 2010 based on data and estimates, and makes a forecast of energy savings for 2016.

42. Pursuant to EU directive 2009/28/EC, Greece submitted its NREAP to the European Commission in 2010, which sets out Greece's national targets for the share of energy from renewable sources consumed in transport, electricity, and heating and cooling in 2020. Based on directive 2009/28/EC, Greece has a mandatory renewable energy sources (RES) target of 18.0 per cent of final energy consumption by 2020. Owing to its successful national promotion of RES, Greece has voluntarily increased its RES target to 20.0 per cent of final energy consumption by 2020. NREAP takes into account the effects of other PaMs relating to energy efficiency on final consumption of energy, and presents PaMs that require achievement of Greece's national overall targets, such as the feed-in tariff to incentivize private development of RES.

43. Table 4 provides a summary of the reported information on the PaMs of Greece.

Table 4
**Summary of information on policies and measures reported by Greece**

| *Sectors affected* | *List of key policies and measures* | *Estimate of mitigation impact (kt $CO_2$ eq) 2020* |
|---|---|---|
| ***Policy framework and cross-sectoral measures*** | Second national climate change programme | IE |
| | European Union Emission Trading System | IE |
| | National renewable energy action plan | IE |
| ***Energy*** | | |
| Energy supply | Promotion of natural gas | 12 582 |
| Renewable energy | Promotion of renewable energy | 20 323 |
| Energy efficiency | Second national energy efficiency action plan (2nd NEEAP) | IE |
| Residential and commercial sectors | Partial implementation of 2nd NEEAP | 2 200 |
| ***Transport*** | Biofuel use in transportation | 2 173 |
| | Excise duty on vehicle transport fuels | NE |
| | Value added tax rate on motor vehicle fuels | NE |
| | Interventions in vehicles | 300 |
| | Promotion of energy-efficient vehicles | NE |
| ***Industrial sectors*** | Partial implementation of 2nd NEEAP | 300 |
| ***Agriculture*** | National strategic plan for rural development | IE |
| | Establishing common rules for direct support schemes under the common agricultural policy | 880 |
| ***Forestry*** | Broad forestry protection / restoration | NE |
| ***Waste management*** | Recovery of organic waste | 800 |
| | Recovery of biogas | 500 |

*Note*: The greenhouse gas reduction estimates given for some measures are reductions in carbon dioxide equivalent for 2020.

*Abbreviations*: IE = included elsewhere, NE = not estimated.

### 3. Policies and measures in the energy sector

44. Between 1990 and 2012, GHG emissions from the energy sector increased by 13.7 per cent (10,531.67 kt $CO_2$ eq), with the increases from 1990 to 2007 mainly owing to economic growth and the related increase in energy consumption. For the period 2008–2012, emissions in the energy sector decreased mainly owing to the economic recession. GHG emissions from energy usage in the manufacturing industry and construction showed a notable decrease of 40.0 per cent from 1990 to 2012 (3,681.70 kt $CO_2$ eq).

45. ***Energy supply***. The total gross inland energy consumption in Greece increased by approximately 23 per cent during the period 1990–2011. In 2011, the consumption of solid fuels and oil products accounted for 79.5 per cent of total consumption, while the contributions of biomass and other RES (i.e. hydropower, solar energy, wind energy and geothermal energy sources) were 2.6 per cent and 3.4 per cent, respectively. The energy supply sector in Greece consists of primary lignite production, refineries, transport and distribution of natural gas, and electricity generation. Lignite, which is a main domestic energy source in Greece, accounted for approximately 55 per cent of electricity production and 28 per cent of the total energy supply in 2011.

46. One of Greece's main PaMs in the energy supply sector is the "promotion of natural gas". In its NC6, Greece indicated that supporting natural gas in its national energy system is a major priority of its national energy policy. The deregulation of electricity and natural gas markets, as well as the completion of the first private power generation units in the 1990s, are considered to be the two main reasons for the increase of the penetration level of natural gas in the power generation sector. In addition, the EU ETS plays an important role in supporting natural gas in the energy system, which leads to further utilization of cleaner fuels. As mentioned in the NC6 and during the review, Greece has also undertaken a number of actions from 1996 to 2013 to promote natural gas, including maintaining no excise duty, reducing personal income tax for converting home heating systems to natural gas or installing new natural gas heating systems, providing discounts on connection fees, developing natural gas infrastructures and establishing measures to market the benefits of natural gas and encourage fuel switching.

47. ***Renewable energy sources***. As discussed in paragraph 42 above, Greece's NREAP sets out Greece's national target of 20.0 per cent of primary energy use from RES in 2020. The indicative penetration levels of RES are estimated to be 40 per cent in the electricity sector, 20 per cent in the heating sector and 10 per cent in the transport sector. In the electricity sector, Greece has projected levels of approximately 4.7 GW from wind energy plants and 3.6 GW from photovoltaic sources in 2020.

48. The primary underlying PaM is the feed-in tariff for incentivizing renewable energy installations. Greece adjusts the feed-in tariff levels periodically for different renewables categories, based on modelling, achievement of targets and perceived policy needs. The feed-in tariffs are scheduled to reduce in price over time, given anticipated reductions in technology costs. In addition, Greece has implemented measures to facilitate the installation of RES, including simplifying the licensing of smaller projects, incentives to reduce community resistance to local renewables development and a centralized process for RES development permitting.

49. ***Energy efficiency***. In 2012, the EU adopted directive 2012/27/EU on energy efficiency. This directive establishes a common framework of measures for the promotion of energy efficiency within the EU to ensure the achievement of the EU 20.0 per cent

energy efficiency target in 2020. It establishes rules designed to remove barriers in the energy market and overcome market failures that impede efficiency in the supply and use of energy, and provides for the establishment of indicative national energy efficiency targets for 2020.

50. Pursuant to the EU energy efficiency directive, Greece has to report annually on the progress achieved towards national energy efficiency targets. Moreover, by 30 April 2014, and every three years thereafter, Greece has to prepare and submit a national energy efficiency action plan (NEEAP), which covers significant energy efficiency improvement measures and expected and/or achieved energy savings, including those in the supply, transmission and distribution of energy, as well as energy end-use. Pursuant to an end-use efficiency and energy services directive (2006/32/EC), Greece has submitted two NEEAPs, one in 2007 and one in 2011, as discussed in paragraphs 40 and 41 above.

51. ***Residential and commercial sectors***. PaMs regarding the conservation and efficient use of energy in the residential and commercial sectors are implemented through the second national climate change programme and the 1st and 2nd NEEAPs. These PaMs primarily concern actions for the improvement of the efficiency of residential sector buildings and the promotion of energy-efficient appliances and heating equipment. These actions are also supported in the Greek legislation of directive 2002/91/EC by law 3661/08 and joint ministerial decision D6/B/14826, which establish specific requirements for minimum building performance requirements for new construction, energy usage certification for existing buildings, regular inspection of boilers, heating installations and air-conditioning systems in buildings, mandatory replacement of energy-efficient lights, and financial incentives and subsidies for the replacement of less-efficient household devices with new energy-efficient ones.

52. Greek law L3855/2010 on "measures to improve energy efficiency in end-use, energy services and other provisions", which transposes directive 2006/32/EC, plans specific measures for public sector buildings to improve their energy performance. Additionally, it sets the framework for the establishment of the ESCO (energy services/savings companies) market in Greece through energy performance contracts and coordinates the promotion of green public procurement.

53. ***Transport sector***. Greece's PaMs in the transport sector are divided into three primary categories: fiscal measures, development and enhancement of the public transport system, and measures related to private vehicles. Fiscal measures are considered by the Greek Government to be supporting policies, and the mitigation impacts of these measures have not been estimated. Greece has imposed an excise duty on vehicle transport fuels, including petrol and diesel. There is also a value added tax rate, applicable to motor vehicle fuels, of 23.0 per cent.

54. In addition, incentives for the replacement of passenger cars and promotion of energy-efficient vehicles (natural gas powered, biofuel powered or hybrid cars) are implemented or being planned. According to EU directive 2003/30/EC, 5.75 per cent of the total quantity of diesel and gasoline consumed in road transportation in Greece, based on the energy content, has to be biofuel in 2010. The target for 2020 is 10.0 per cent according to EU directive 2009/28/EC, which Greece has approved into national law L3851/2010.

55. ***Industrial sector***. The main PaM for the reduction of GHG emissions in the industrial sector is the EU ETS. The price on carbon is expected to provide the industrial plants with incentives to invest in energy-efficient measures and combined heat and power, and switch to fuels and/or other feedstock, such as natural gas or biomass, that produce less GHG emissions. The 2nd NEEAP is also anticipated to achieve energy efficiency savings in the industrial sector through an increase in combined heat and power plants.

### 4. Policies and measures in other sectors

56. Between 1990 and 2012, GHG emissions from industrial processes (including solvent and other product use), agriculture and waste decreased by 15.9 per cent (4,473.15 kt $CO_2$ eq), mainly owing to $CH_4$ emission reductions resulting from better methods of solid waste disposal on land, including increased recycling rates and biogas capture, and $N_2O$ emission reductions resulting from the reduction in the use of synthetic nitrogen fertilizers. However, there is a notable increase in emissions from the consumption of F-gases, which consist mainly of the HFCs from replacing CFCs and HCFCs (ozone-depleting substances) in cooling equipment and extending the application of F-gases in modern technologies.

57. ***Industrial processes***. Between 1990 and 2012, GHG emissions from the industrial processes sector decreased by 9.4 per cent (998.73 kt $CO_2$ eq), mainly owing to the decrease in mineral product production and cement production, mainly owing to the effects of the economic recession. Regarding industrial processes, Greece has the commitment to implement EU directive 2002/96/EC and its modification 2003/108/EC for the recovery of F-gases from air-conditioning and refrigeration equipment. The directives have been incorporated into national legislation. Furthermore, regulation (EC) 1005/2009 of the European Parliament and of the Council concerning ozone-depleting substances is the main tool for the implementation of the Montreal Protocol in the EU. The regulation adopts a time schedule for the reduction of HFCs, with specific quantitative targets for several periods (2010–2013, 2014–2016 and 2017–2019) compared to 1997 production. Production of HFCs in the EU is not allowed after 2019; no plants in Greece have produced chlorodifluoromethane (HCFC-22) since 2006.

58. ***Agriculture***. Between 1990 and 2012, GHG emissions from the agriculture sector decreased by 20.3 per cent (2,331.75 kt $CO_2$ eq), mainly owing to the reduction of $N_2O$ emissions from agricultural soils, resulting from the reduction in the use of synthetic nitrogen fertilizers. The decrease in the use of synthetic nitrogen fertilizers is attributed to the increase in organic farming, the high price of fertilizers and the impacts of initiatives to promote good practice in fertilizer use. The changes in the other variables of GHG emissions from the agriculture sector, including animal population and crop production, have a minor effect on the GHG emission trend.

59. The legislative framework concerning the rules for agriculture production in Greece is fully harmonized with the EU Common Agricultural Policy, which incorporates actions contributing to the decrease of GHG emissions from agricultural activities. The national strategic plan for rural development defines the priorities of Greece for the period 2007–2013, in accordance with article 11 of regulation (EC) 1698/2005 on the support of rural development by the European agricultural fund for rural development, which stipulates that the national rural development strategy will be implemented through the rural development programme 2007–2013. Rural development policy 2007–2013 for Greece focuses on three main areas: improving the competitiveness of agriculture and forestry, improving the environment and countryside, and improving the quality of life in rural areas and diversification of the rural economy.

60. ***LULUCF***. The LULUCF sector was a net removal of 2,865.55 kt $CO_2$ eq in Greece in 2012, and net GHG removals increased by 751.27 kt $CO_2$ eq since 1990. The sink capacity of the LULUCF sector fluctuates between 1,760 kt $CO_2$ eq and 3,200 kt $CO_2$ eq, showing a slightly decreasing trend over time. This is as a result of the decrease of the sink capacity of the cropland category and the increase of the sink capacity of the forest land category.

61. The PaMs for the LULUCF sector stem from rural development actions and other financial mechanisms. Forest protection, primarily in the context of the forest fires

prevention policy, includes fuel management and vegetation treatment in the most vulnerable forest areas, conservation of the existing mountainous road network and the development of new roads where necessary, and public awareness campaigns. One of the main responsibilities of the Greek Forest Service is forest management through the development and implementation of forest management plans. For such purposes, financial and human resources are allocated either to update the forest management plans that have expired or to develop new ones. The Forest Service also focuses on the rehabilitation of burned and degraded (flood and erosion protection) forest lands.

62. ***Waste management***. Between 1990 and 2012, GHG emissions from the waste sector decreased by 19.6 per cent (1,152.80 kt $CO_2$ eq). Economic development has resulted in an increase in waste generation; however, the increase of recycling, along with exploitation of the biogas produced in land disposal sites, limits the increase of $CH_4$ emissions. At the same time, emissions from wastewater handling plants have considerably decreased, owing to the continuous increase of the population served by aerobic wastewater handling facilities.

63. The reduction of biodegradable waste sent to landfills is the most important measure for waste sector GHG mitigation, closely followed by recovery or flaring of landfill gas, which has been implemented in all managed sites for urban centres with populations greater than 100,000 people. Therefore, the managed disposal sites serving the population of the largest cities of Greece are equipped with systems for the collection or flaring of biogas.

## 5. Policies and measures related to implementation of commitments under the Kyoto Protocol

64. Greece reported on its package of PaMs adopted, implemented and elaborated in achieving its commitment under the Kyoto Protocol. Greece specifically addressed PaMs implemented in achieving its quantified emission limitation and reduction commitment under Article 3 of the Kyoto Protocol, in order to promote sustainable development.

65. The NC6 includes information on how Greece promotes and implements the *International Civil Aviation Organization International Maritime Organization* decisions to limit emissions from aviation and marine bunker fuels, through participation in collective EU decision-making on these subjects.

66. In its NC6, Greece reported information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts, on other Parties, especially developing country Parties. Further information on how Greece strives to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, as reported in the 2014 annual submission, is presented in chapter III.B below.

67. The NC6 underlines that Greece follows EU policies, which take into account the minimization of adverse effects of emission reduction PaMs, according to Articles 4.8 and 4.9 of the Convention and Article 2 of the Kyoto Protocol. The EU has a wide-ranging impact assessment system for all new policy initiatives, ensuring that potential adverse social, environmental and economic impacts on various stakeholders and third parties are identified and minimized within the legislative processes. Existing international policy dialogues are also used to keep developing countries fully informed of forthcoming initiatives, and as a means of exchanging information, data and results of preparatory studies with partner countries and other external stakeholders.

## C. Projections and the total effect of policies and measures, including information on supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

68. In its NC6, Greece reported on two emission projection scenarios until 2030. No updated emission projections were provided during the review; however, a preliminary analysis of future energy scenarios was provided.

### 1. Projections overview, methodology and key assumptions

69. The GHG emission projections provided by Greece in the NC6 include a 'with measures' and a 'with additional measures' scenario until 2030, presented relative to actual inventory data for 1990, 1995, 2000, 2005 and 2010. During the review, Greece clarified that the actual inventory data for 2011 were also used in the preparation of the emission projections, although no GHG emission data for 2011 were presented in the NC6. Therefore, to improve the transparency of its projections, the ERT encourages Greece to identify all the years in which actual inventory data were used in the preparation of the emission projections, and provide the GHG emissions for those years, in its next NC.

70. In the NC6, projections were presented on a sectoral basis and on a gas-by-gas basis for the following GHGs: $CO_2$, $CH_4$, $N_2O$, PFCs, HFCs and $SF_6$. Emission projections related to fuel sold to ships and aircraft engaged in international transport were reported separately and not included in the totals. However, Greece did not present the projections using the same sectoral categories used in the PaMs section. To improve the transparency of its projections, the ERT recommends that Greece present its projections on a sectoral basis, to the extent possible, using the same sectoral categories as for its PaMs in its next NC. In addition, Greece did not include projections for indirect GHGs, such as carbon monoxide, nitrogen oxides, non-methane volatile organic compounds and sulphur oxides, in its NC6. To increase the completeness of reporting, the ERT encourages Greece to provide projections of indirect GHGs in its next NC.

71. Projections are also provided in an aggregated format for each sector, as well as for a national total, using global warming potential (GWP) values. Greece reported the GWP values it uses for its annual GHG inventory in annex A.III of the NC6; however, Greece did not clearly state that these are also the GWPs used in the preparation of its emission projections. To improve the transparency of its projections, the ERT recommends that Greece identify which GWPs are used in the preparation of its emission projections in its next NC.

72. Greece provided a 'with measures' scenario that includes all implemented and adopted PaMs, in accordance with the definition contained in the UNFCCC reporting guidelines on NCs. Greece also provided a 'with additional measures' scenario, which included planned PaMs with GHG mitigation impacts that will mainly be realized after 2020. However, in its NC6, Greece did not clearly identify which specific PaMs were included in the 'with additional measures' scenario. During the review, the Party provided this information to the ERT in a tabular format. To improve the transparency of the projections, the ERT recommends that Greece include such information in its next NC.

73. During the review, Greece stated that it uses a top-down approach for its GHG emission projections. This includes the use of specific assumptions and conditions based on national targets and EU directives to create the parameters for the 'with measures' and 'with additional measures' scenarios. To estimate the effect of individual PaMs and the total effect of PaMs, the 'with measures' and 'with additional measures' scenarios are compared to projection scenarios without such measures (i.e. baseline scenarios), which are not included in the NC6. However, in the NC6, it is not transparent what assumptions and

conditions are included in such comparisons. For example, the 'with measures' scenario assumes the achievement of Greece's 20.0 per cent RES target under the ESD, whereas the baseline scenario assumes no RES in Greece's energy supply through 2020. As RES would be present in Greece's energy supply, even without its 20.0 per cent RES target, this type of assumption may not accurately represent a baseline scenario without the PaMs reported in the NC6.

74. In addition, the implementation years for the various actions within each PaM that are included in the projections are not clearly identified. For example, the "promotion of natural gas in the power sector", which encompasses many actions such as the gradual decommissioning of old inefficient thermal power units and commissioning of new ones, and the increasing use of natural gas in electricity production, has a reported implementation year of 1996. During the review, Greece explained that the implementation of the promotion of natural gas PaMs was reported as 1996, as that was the year when natural gas was introduced into Greece's energy mix.

75. To increase the transparency of reporting, and to avoid a potential overestimation of the mitigation impact of PaMs, the ERT encourages Greece to: (a) provide additional information on the characteristics of its modelling approach to projecting GHG emissions and removals and estimating the total effects of PaMs on emissions and removals, (b) clearly identify which year each PaM (or action within each PaM) is assumed to be implemented in its emission projections and (c) provide estimates for a 'without measures' scenario, in its next NC.

76. In its NC6, Greece did not report any changes to the emission projections methodology or key assumptions compared to the NC5. However, during the review, the ERT was informed that the modelling approach for the energy sector has been changed since the NC5 to include the use of a multiregional TIMES-MARKAL model to improve the accuracy of the energy sector projections. To enhance the transparency of reporting, the ERT encourages Greece to report the main differences in the assumptions, methods employed and results between projections in the current NC and those in earlier NCs, in its next NC.

77. In its NC6, Greece provided updated key assumptions following the recent economic development, including all potentially important variables for the energy, energy industries, industrial combustion, residential and commercial/institutional, and transport sectors. Such information includes international fuel prices, population, GDP, prices of $CO_2$ emission allowances and energy demand. Greece also provided information for five additional scenarios of GHG emission projections for sensitivity analysis purposes. The sensitivity analysis only included the energy sector because it accounts for more than 80 per cent of the GHG emissions in Greece. Based on the five sensitivity scenarios examined, the deviation of key input variables from the 'with measures' and 'with additional measures' scenarios is projected to have a small effect on total GHG emissions in 2015 (a decrease of approximately 1–2 per cent). However, the total emissions for the year 2020 are estimated to increase by approximately 3–7 per cent.

### 2. Results of projections

78. Within the burden-sharing agreement of the EU for meeting commitments under the Kyoto Protocol, Greece committed itself to limiting its GHG emission growth to 25.0 per cent compared with the base year level. The average annual emissions for Greece during the first commitment period of the Kyoto Protocol (2008–2012) were 119,700.82 kt $CO_2$ eq, which is 11.9 per cent above the base year level. Therefore, Greece will most likely meet its Kyoto Protocol target of limiting GHG emission growth by 25.0 per cent compared to the base year level by domestic efforts alone (PaMs and the use of accounting for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol), without making use of the

provisions in Articles 6, 12 or 17 of the Kyoto Protocol. For the second commitment period of the Kyoto Protocol (2013–2020), the EU and its 28 member States (EU-28) have agreed to reduce emissions by 20.0 per cent by 2020 compared with the 1990 level (equivalent to a 14 per cent reduction compared with in 2005).

79. Under the Convention, the EU-28 communicated an independent quantified economy-wide emission reduction target of 20.0 per cent below the 1990 level by 2020. The joint target of the EU-28 is implemented through binding legislation known as the EU climate and energy package, which was adopted in 2009. The EU-28 plans to meet the target through efforts divided among member States (ESD) in ETS and non-ETS sectors as follows: (a) a 21.0 per cent GHG emission reduction by 2020 compared with the 2005 level in ETS sectors and (b) a 10.0 per cent GHG emission reduction by 2020 compared with the 2005 level under the ESD in non-ETS sectors. The ESD includes binding renewable energy goals and non-binding energy efficiency goals for each member State. The EU climate and energy package allows certified emission reductions and emission reduction units to be used for compliance purposes, subject to a number of restrictions, including a limit of 50.0 per cent of the required reduction below the 2005 level for the ETS sectors. With regard to the target under the Convention for the EU-28, emissions and removals from the LULUCF sector are excluded from non-ETS sectors under the ESD.

80. Greece's non-ETS sector GHG emission target is to reduce GHG emissions by 4.0 per cent by 2020 compared with the 2005 level. In addition, under the ESD, Greece has committed to achieving a binding target of an 18.0 per cent share of RES of final energy consumption by 2020, which it has voluntarily increased to 20.0 per cent of final energy consumption by 2020. Greece also has a non-binding target under the ESD to achieve a reduction in end-use energy consumption of 9.0 per cent (16.46 TWh) for the period 2008–2016 compared to the average of 2001–2005. Under directive 2012/27/EU, this translates into an indicative national target of primary energy consumption for 2020 of 27.1 Mtoe.

81. Overall, Greece's reported projections of total GHG emissions for 2020 and 2030 show a decreasing emission trend. Total emissions in 2020 are expected to be at levels that are 0.1 per cent and 1.0 per cent below the 1990 level in the 'with measures' and 'with additional measures' scenarios, respectively. Total emissions in 2030 are expected to be at levels that are 4.5 per cent and 9.6 per cent below the 1990 level in the 'with measures' and 'with additional measures' scenarios, respectively. The projected emission levels under different scenarios and information on the Kyoto Protocol targets and quantified economy-wide emission reduction target are presented in table 5 and the figure.

82. In its NC6, Greece provided emission projections separately for ETS sectors and non-ETS sectors. The reported emission projections indicate that Greece's GHG emissions will be 58,228 kt $CO_2$ eq for non-ETS sectors in 2020. During the review, Greece informed the ERT that Greece's annual emission allocations for 2020 are 60,652 kt $CO_2$ eq, which are based on its non-ETS target to reduce GHG emissions by 4.0 per cent by 2020 compared with the 2005 level. Therefore, Greece is expected to meet its non-ETS target for 2020. To increase transparency and to facilitate the assessment of the progress of the Party towards achieving its target for the non-ETS sectors by 2020, Greece may consider including its annual emission allocations for 2020 in its next NC.

83. On a gas-by-gas basis, Greece reported that $CO_2$ emissions in 2012 were 90,472.38 kt $CO_2$ eq, accounting for 81.5 per cent of total GHG emissions. According to the projections, $CO_2$ emissions will decrease to 82,102.59 kt $CO_2$ eq in 2020 in the 'with measures' scenario (9.3 per cent decrease) and they will decrease to 81,008.62 kt $CO_2$ eq in 2020 in the 'with additional measures' scenario (10.5 per cent decrease). $CH_4$ emissions in 2012 were 9,706.24 kt $CO_2$ eq, accounting for 8.7 per cent of the total GHG emissions. According to the projections, $CH_4$ emissions will increase to 9,889.46 kt $CO_2$ eq in 2020 in the 'with measures' scenario (1.9 per cent increase), and they will increase to 9,867.06 kt

$CO_2$ eq in 2020 in the 'with additional measures' scenario (1.7 per cent increase). $N_2O$ emissions in 2012 were 6,810.88 kt $CO_2$ eq, accounting for 6.1 per cent of the total GHG emissions. According to the projections, $N_2O$ emissions will increase to 7,205.91 kt $CO_2$ eq in 2020 in the 'with measures' scenario (5.8 per cent increase), and they will increase to 7,346.18 kt $CO_2$ eq in 2020 in the 'with additional measures' scenario (7.9 per cent increase).

84. The most significant sectoral GHG emission increases under the 'with measures' scenario from 2012 to 2020 are projected to occur in the transport sector (7,615.83 kt $CO_2$ eq, or 47.3 per cent), followed by the industry/industrial processes sector (3,799.37 kt $CO_2$ eq, or 39.5 per cent) and the agriculture sector (667.76 kt $CO_2$ eq, or 14.1 per cent). Over the same time period, GHG emissions from the energy sector are projected to significantly decrease by 35,686.11 kt $CO_2$ eq, or 38.6 per cent. If additional measures are considered ('with additional measures' scenario), the sectoral proportions remain approximately the same, with an additional emission reduction of 976.10 kt $CO_2$ eq in the total emission projections, mainly owing to additional measures in the energy and transport sectors.

Table 5
**Summary of greenhouse gas emission projections for Greece**

| | *Greenhouse gas emissions (kt $CO_2$ eq per year)* | *Changes in relation to the base year[a] level (%)* | *Changes in relation to the 1990 level (%)* |
|---|---|---|---|
| Kyoto Protocol base year[a] | 106 987.17 | | 2.0 |
| Kyoto Protocol target for the first commitment period (2008–2012) | 133 733.96 | 25.0 | 27.4 |
| Kyoto Protocol target for the second commitment period (2013–2020)[b] | Not available yet | | |
| Quantified economy-wide emission reduction target under the Convention[a] | Not available yet | | |
| Inventory data 1990[b] | 104 935.53 | –1.9 | |
| Inventory data 2012[b] | 110 994.06 | 3.7 | 5.8 |
| Average annual emissions for 2008–2012[b] | 119 700.82 | 11.9 | 14.1 |
| 'With measures' projections for 2020[b] | 104 852.37 | –2.0 | –0.1 |
| 'With additional measures' projections for 2020[b] | 103 876.27 | –2.9 | –1.0 |
| 'With measures' projections for 2030[b] | 100 184.05 | –6.4 | –4.5 |
| 'With additional measures' projections for 2030[b] | 94 899.33 | –11.3 | –9.6 |

[a] "Base year" in this column refers to the base year used for the targets under the Kyoto Protocol, while for the target under the Convention it refers to the base year used for that target.

[b] The Kyoto Protocol base year level of emissions is provided in the initial review report contained in document FCCC/IRR/2007/GRC.

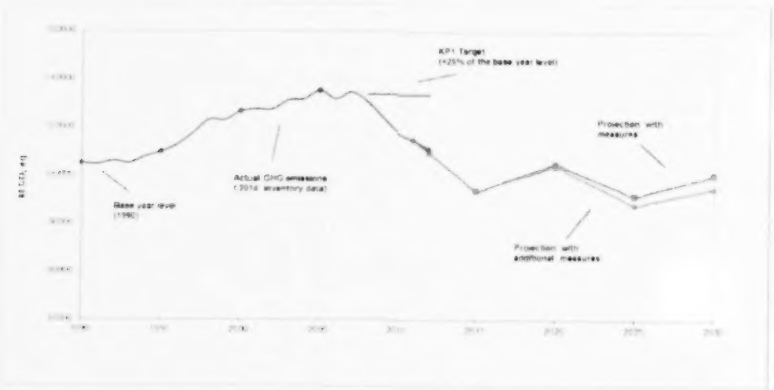
[f] The Kyoto Protocol target for the second commitment period (2013–2020) is a joint target for the European Union and its 28 member States and Iceland. The target is to reduce emissions by 20.0 per cent by 2020 compared with the base year (1990) level. The target for sectors not covered by the European Union Emissions Trading System is 4.0 per cent for Greece under the European Union effort-sharing decision.

[g] Quantified economy-wide emission reduction target under the Convention is a joint target for the European Union and its 28 member States. The target is to reduce emissions by 20.0 per cent by 2020 compared with the base year (1990) level.

[h] Greece's 2014 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry.

[i] Greece's sixth national communication and/or first biennial report.

**Greenhouse gas emission projections**




*Sources*: (1) Data for the years 1990–2012: Greece's 2014 greenhouse gas inventory submission (version 2.1); the emissions are without land use, land-use change and forestry. (2) Data for the years 2013–2030: Greece's sixth national communication and/or first biennial report; the emissions are without land use, land-use change and forestry.

*Note*: The target for the second commitment period of the Kyoto Protocol is based on preliminary estimates of the base year emissions for the first commitment period of the Kyoto Protocol and quantified emission limitation or reduction objective included in annex I to decision 1/CMP.8. The initial assigned amount for the second commitment period will be established after the initial review for the second commitment period of the Kyoto Protocol.

*Abbreviations*: GHG = greenhouse gas, KP1 = Kyoto Protocol first commitment period.

## 3. Total effect of policies and measures

85. In the NC6, Greece presents the estimated and expected total effects of implemented and adopted PaMs, in accordance with the 'with measures' definition, compared with a situation without such PaMs, as well as the total expected effect of planned PaMs information in terms of GHG emissions avoided or sequestered, by gas (on a $CO_2$ eq basis), in 2005, 2010, 2015 and 2020 for implemented and adopted PaMs, and in 2020 for planned PaMs.

86. Greece reported that the total estimated effect of adopted and implemented PaMs is 33,262 kt $CO_2$ eq in 2015 and 40,058 kt $CO_2$ eq in 2020. According to the information reported in the NC6, PaMs implemented in the energy sector will deliver the largest emission reductions, followed by the effect of PaMs implemented in the residential and tertiary sector and the waste management sector. The most effective PaMs and drivers behind GHG emission reductions are described in chapter II.B above. Table 6 provides an overview of the total effect of PaMs as reported by Greece.

Table 6
**Projected effects of planned, implemented and adopted policies and measures in 2015 and 2020**

| Sector | *Effect of implemented and adopted measures (kt $CO_2$ eq)* | *Relative value (% of 1990 emissions)* | *Effect of planned measures (kt $CO_2$ eq)* | *Relative value (% of 1990 emissions)* | *Effect of implemented and adopted measures (kt $CO_2$ eq)* | *Relative value (% of 1990 emissions)* | *Effect of planned measures (kt $CO_2$ eq)* | *Relative value (% of 1990 emissions)* |
|---|---|---|---|---|---|---|---|---|
| | *2015* | | | | *2020* | | | |
| Energy (without transport) | 29 942 | 48.1 | NE | NA | 35 078 | 56.4 | 425 | 0.7 |
| Transport | 150 | 1.0 | NE | NA | 300 | 2.1 | NE | NA |
| Industrial processes | 200 | 1.9 | NE | NA | 300 | 2.8 | 350 | 3.3 |
| Agriculture | 670 | 5.9 | NE | NA | 880 | 7.7 | NE | NA |
| Residential and tertiary | 1 300 | NA | NE | NA | 2 200 | NA | 200 | NA |
| Waste management | 1 000 | 17.0 | NE | NA | 1 300 | 22.1 | NE | NA |
| **Total** | **33 262** | **31.7** | NE | NA | **40 058** | **38.2** | **975** | **0.9** |

*Source*: Greece's sixth national communication and/or first biennial report.

*Note*: The total effect of implemented and adopted policies and measures is defined as the difference between the 'without measures' and 'with measures' scenarios; the total effect of planned policies and measures is defined as the difference between the 'with measures' and 'with additional measures' scenarios.

*Abbreviation*: NA = not available, NE = not estimated.

### 4. Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

87. Greece in its NC6 provided information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. The ERT noted that Greece does not intend to use the market-based mechanisms to meet its Kyoto Protocol target – neither for the target for the Kyoto Protocol first commitment period nor for the target for the Kyoto Protocol second commitment period.

## D. Provision of financial resources and technology transfer to developing country Parties, including information under Articles 10 and 11 of the Kyoto Protocol

### 1. Financial resources, including "new and additional" resources and resources under Article 11 of the Kyoto Protocol

88. In its NC6, Greece provided information on provision of support required under the Convention and its Kyoto Protocol.

89. In its NC6, Greece provided details on measures taken to give effect to its commitments under Article 4, paragraphs 3, 4 and 5, of the Convention as required by the UNFCCC reporting guidelines on NCs and under Article 11 of the Kyoto Protocol, as required by the "Guidelines for the preparation of information required under Article 7 of the Kyoto Protocol". However, in its NC6, Greece did not indicate what "new and additional" financial resources it has provided pursuant to Article 4, paragraph 3, of the Convention and did not clarify how it has determined such resources as being "new and additional". During the review, Greece stated that funds were determined as "new and

additional" if they were new sources or amounts of funding since the last NC reporting period (since 2008), and climate change supporting activities were targeted. To increase the completeness of reporting, the ERT recommends that Greece include this information in its next NC.

90. Greece has reported information on the assistance it has provided to developing country Parties that are particularly vulnerable to the adverse effects of climate change to help them to meet the costs of adaptation to those adverse effects. Furthermore, Greece has provided information on other financial resources related to the implementation of the Convention provided through bilateral, regional and other multilateral channels. In particular, it provided financial resources related to the implementation of the Convention through bilateral, regional and other multilateral channels, including the Global Environment Facility, the EU, the World Bank Group and United Nations bodies.

91. The overall responsibility for development cooperation lies with the Ministry of Foreign Affairs, where the General Directorate for International Development Cooperation (Hellenic Aid) coordinates programming, allocation and monitoring of development cooperation multilateral and bilateral funding. Development cooperation funds are also channelled through other public bodies, such as the Ministry of Economy, which is responsible for Greece's contributions to multilateral institutions. MEECC is responsible for the allocation of annual official multilateral and multi-bilateral contributions to international organizations, United Nations convention secretariats, trust funds and agencies related to environmental issues.

92. With regard to the most recent financial contributions to enhance the implementation of the Convention by developing countries, Greece provided a cumulative contribution of official development assistance (ODA) of USD 2,570 million to multilateral institutions and programmes, as well as through bilateral development cooperation, for 2008–2012. Total ODA (bilateral and multilateral) granted by Greece in 2012 reached USD 327.41 million, which is a decrease of USD 97.36 million (approximately 23.1 per cent) in relation to 2011 due to Greece's difficult fiscal circumstances. Greece, represented by the Ministry of Economy and Finance, has contributed to the Global Environment Facility replenishments. Over the period 2005–2011, Greece contributed annually an average amount of USD 91,488 to the UNFCCC Fund. Table 7 summarizes information on financial resources.

Table 7

**Summary of information on financial resources for 2008–2012**

(United States million dollars)

| *Allocation channel of public financial support* | *Years of disbursement* | | | | |
|---|---|---|---|---|---|
| | *2008* | *2009* | *2010* | *2011* | *2012* |
| Contributions through multilateral channels, including | | | | | |
| Contributions through bilateral channels | 312 | 297 | 212 | 154 | 107 |
| Contributions through United Nations bodies | 14.19 | 13.75 | 12.85 | 12.15 | 10.15 |
| European Union | 238.87 | 286.06 | 277.60 | 256.36 | 204.05 |
| World Bank Group | 79.51 | 0.00 | 0.00 | 0.00 | 0.00 |
| Regional banks | 44.27 | 0.72 | 1.01 | 0.00 | 0.69 |
| Other | 14.15 | 9.80 | 4.44 | 2.36 | 5.22 |

### 2. Technology transfer, including information under Article 10 of the Kyoto Protocol

93. Greece has provided in its NC6 information on activities related to the transfer of technology and notable activities by the public and private sectors. A detailed review of reported information is provided in chapter II.D.3 of the report of the technical review of the first biennial report.

94. In its NC6, Greece included textual information on regional technology transfer programmes and included examples of technology transfer projects in tabular format. The ERT noted that the examples of technology transfer projects that are included in the NC6 were the same projects as those reported in the NC5. In addition, Greece did not use table 6 in the UNFCCC reporting guidelines on NCs to report activities related to technology transfer. To increase the completeness of reporting, the ERT recommends that Greece use, where feasible, table 6 of the UNFCC reporting guidelines on NCs to report relevant technology transfer activities in its next NC.

95. In its NC6, Greece reported activities undertaken by the public sector related to the promotion, facilitation and financing of the transfer of, or access to, environmentally sound technologies. However, Greece did not report in what way they have encouraged private sector activities, and how these activities could help meet the commitments of Parties under Articles 4.3, 4.4 and 4.5 of the Convention. To increase the completeness of reporting, the ERT encourages Greece to indicate in what way it has encouraged private sector activities, and how these activities help meet the commitments of Parties under Articles 4.3, 4.4 and 4.5 of the Convention, in its next NC.

96. In its NC6, Greece reported its activities for financing access by developing countries to 'soft' environmentally sound technologies. During the review, Greece explained that it prefers the 'soft' approach, such as capacity-building, when engaging with developing countries. In addition, Greece explained that owing to the economic crisis, it is no longer in a position to provide 'hard' technology transfer programmes as it did in the past. To increase the completeness of reporting, Greece may consider providing information regarding financing access by developing countries to 'hard' technologies (if available), or report why it is not feasible to finance access to such technologies, in its next NC.

97. Furthermore, Greece has reported in textual format on the steps taken by governments to promote, facilitate and finance the transfer of technology, and to support the development and enhancement of endogenous capacities and technologies of developing countries by citing continued involvement and activities within the Mediterranean component of the EU initiative Water for Life, cooperation on environmental protection within the Black Sea Economic Cooperation Organization and the Horizon 2020 initiative on depolluting the Mediterranean.

## E. Vulnerability assessment, climate change impacts and adaptation measures

98. In its NC6, Greece has provided the required information on the expected impacts of climate change in the country and on adaptation options. Table 8 summarizes the information on vulnerability and adaptation to climate change presented in the NC6.

Table 8
**Summary of information on vulnerability and adaptation to climate change**

| *Vulnerable area* | *Examples comments adaptation measures reported* |
|---|---|
| Agriculture and food | *Vulnerability*: impacts on agriculture and food security will defer. |

| *Vulnerable area* | *Examples, comments, adaptation measures reported* |
|---|---|
| security | depending on the climate zone, the type of crop and the climate change scenario, proliferation of invasive pests, impacts on crop productivity will affect farmers' income and employment<br>*Adaptation*: participation in the European Union adaptation of agriculture in European regions at environmental risk under climate change project, which addresses adaptation of agriculture at environmental risk under climate change; adoption of the national action plan for combating desertification (2001) |
| Coastal zones | *Vulnerability*: coastline erosion, storm surges<br>*Adaptation*: adoption of the national framework for spatial planning and sustainable development, which embeds considerations of coastal zone management into the creation of new settlements or the expansion of existing ones; adoption of the specific framework spatial plan of coastal areas and islands, which considers climate change impacts in the management of coastal zones; incorporation of the European Commission's marine strategy directive (2008/56) into national legislation |
| Energy | *Vulnerability*: impact on hydropower generation; reduction in efficiency of thermo-electrical units due to increase in air temperatures; increase in losses of electricity distribution networks<br>*Adaptation*: adoption of the general framework of spatial planning and sustainable development, which requires use of renewable sources of energy; construction of natural gas infrastructures and adoption of energy saving measures |
| Fisheries and aquaculture | *Vulnerability*: changes in biodiversity, fishing ground characteristics and available stocks of commercial importance; production likely to decrease<br>*Adaptation*: adoption of the operational programme fisheries 2007–2013 to ensure the viable and sustainable development of the fisheries sector |
| Forest ecosystem | *Vulnerability*: reduced precipitation and increased temperatures during the hot and dry period; higher risk of devastation from wildfires; desertification due to soil erosion and salinization<br>*Adaptation*: adoption of the programme of rural development 2007–2013, part of which seeks to strengthen the adaptation of forests to climate change; implementation of a Life+ project AdaptFor to pilot an approach of adapting forest management to climate change; participation in the Natura 2000 network to establish protected areas; adoption of the national action plan for combating desertification (2001) |
| Human health | *Vulnerability*: increased mortality due to temperature rise; greater frequency of infectious disease epidemics due to extreme weather events; substantial impacts on human health due to relocation of populations<br>*Adaptation*: national action plan for the response of environmental hazards threatening health for 2008–2012, which includes a special action dedicated to the identification, research and documentation of climate change impacts on health |
| Natural ecosystems and biodiversity | *Vulnerability*: mainly decrease of species population and variety; invasion of alien species<br>*Adaptation*: adoption of law 3937/2011, setting out national priorities regarding conservation of biodiversity |

| *Vulnerable area* | *Examples comments adaptation measures reported* |
|---|---|
| Water resources | *Vulnerability*: decrease in aquifer infiltration and recharge, increased salinity of coastal and subsea aquifers, higher pollutant load concentrations in coastal water bodies and the sea, faster degradation of deltaic regions, contamination of drainage of coastal wetlands, amplification of desertification, droughts<br>*Adaptation*: incorporation of the European Union water framework directive (60/2000/EC) into national legislation, adoption of the framework of measures and procedures for integrated water resource management established in 2007, adoption of river basin management plans 2009–2015, implementation of the Acheloos project to divert water from the Acheloos basin to Thessaly, which is water stressed, incorporation of the European Union floods directive (2007/60/EC) in 2010 |

99. Similar to its NC5, Greece's NC6 focused primarily on vulnerability. Greece notes that its policy response to adaptation has been improving, although its policy efforts remain concentrated on mitigation actions. The ERT notes that Greece has provided updated information on research and studies on possible changes to the climate and the expected impacts of climate change in its NC6 as compared to its NC5. Greece has presented more up-to-date outputs on the impacts of climate change based on the IPCC scenarios and the PRECIS[5] model. Greece has also included the results of more recent studies and projections on the impacts of climate change. For example, the NC6 highlights the results of the 2011 report *Environmental, Economic and Social Impacts of Climate Change in Greece*,[6] which uses RACMO2[7] to project the impacts of climate change using the IPCC scenario A1B.

100. The information in the NC6 presented vulnerability assessments and adaptation policies concerning human health care and transport, in addition to the areas presented in the NC5 (natural ecosystems and biodiversity, agricultural production, forest ecosystems, fisheries and aquaculture, water resources, coastal zones, tourism and energy). Climate change is expected to reduce biodiversity, increase desertification, reduce forest and water resources, and negatively affect human health due to increased mortality and greater frequency of infectious disease epidemics.

101. The ERT notes that since its NC5, Greece has developed a specific framework spatial plan of coastal areas and islands, which includes the impacts of climate change as consideration in the management of coastal zones. As stated in the NC6, the process of setting up a national adaptation strategy is ongoing, and its development is included in the main priorities of MEECC. The ERT reiterates the encouragement expressed by the previous ERT for Greece to provide further information on its national strategy for adaptation to climate change in its next NC.

102. Greece is participating in the climate change and impact research integrated project, funded under the European Commission's sixth framework programme, which highlights impacts and possible adaptation actions for climate change in the Mediterranean (including Parties not included in Annex I to the Convention in North Africa and the Middle East). The project aims to predict and quantify physical impacts of climate change in the Mediterranean, evaluate the socioeconomic consequences of climate change, develop an integrated approach to understanding the combined effects of climate change and identify

[5] Providing Regional Climates for Impacts Studies.

[6] Bank of Greece. 2011. *The Environmental, Economic, and Social Impacts of Climate Change in Greece*. Climate Change Impacts Study Committee.

[7] Regional Atmospheric Climate Model.

adaptation and mitigation measures in collaboration with regional stakeholders. Greece is also leading the Mediterranean component of the EU initiative Water for Life, which assists developing countries in the Mediterranean and south-eastern Europe in the elaboration, implementation and monitoring of integrated water resource management plans.

## F. Research and systematic observation

103. In its NC6, Greece provided information on its actions relating to research and systematic observation, and addressed domestic activities and some of its international activities. In response to a request for additional information by the ERT during the review, Greece stated that, in addition to what is contained in the NC6, it also participates in various activities under the World Climate Programme, the International Geosphere–Biosphere Programme and the IPCC. To increase the completeness of reporting, the ERT recommends that Greece include information on its participation in such activities its next NC.

104. Greece provided information on research related to climate change undertaken by various institutes in Greece, many of which participate in international and regional research programmes. However, Greece did not provide summary information on global climate observing systems activities. During the review, Greece informed the ERT that the information is contained in chapter 8.1.1 of its NC6; however, this section was unintentionally excluded from Greece's official submission to the secretariat. Greece provided the ERT with chapter 8.1.1, which discussed the establishment of institutions in Greece that undertake climate observing activities, such as the National Observatory of Athens and the Hellenic Centre for Marine Research. In addition, chapter 8.1.1 discussed the various institutions involved in the network of systematic observation of climate parameters in Greece, such as the Hellenic National Meteorological Service, the services of the Greek Armed Forces, the Ministry of Rural Development and Food, MEECC, several national research centres and the Public Power Corporation of Greece. To increase the completeness of reporting, the ERT recommends that Greece include such summary information on Global Climate Observing System activities in its next NC.

105. In its NC6, Greece did not provide information about its general policy on and funding of research and systematic observation. During the review, Greece informed the ERT that the information is contained in chapter 8.1.2 of the NC6; however, this section was unintentionally excluded from Greece's official submission to the secretariat. Greece provided the ERT with chapter 8.1.2, which stated that the General Secretariat of Research and Technology of the Ministry of Education and Religious Affairs, Sport and Culture is the responsible institution for supporting and promoting research in Greece. The General Secretariat of Research and Technology policy framework for research and technological development covers all the main phases of the innovation cycle and is designed to optimize use of research results, boost entrepreneurship and support start-ups during their initial steps. Funding for the research sector in Greece comes from public and private funds, including funds from the national budget, the programme of public investments, structural funds and the European Commission. To increase the completeness of reporting, the ERT encourages Greece to include the above information in its next NC.

106. In its NC6, Greece did not include information on the opportunities for and barriers to the free and open international exchange of data and information, as well as actions taken to overcome these barriers. During the review, Greece identified several possible barriers to the free and open international exchange of data and information, namely legal barriers (e.g. the need to license data), economic barriers (e.g. the need to purchase data sets) and practical barriers (e.g. the excessively long delivery times or inconvenient data formats). Meteorological/climatic data from several Greek stations are made freely available through

the European climate assessment data set, as well as daily climatic data from 280 automated stations.[8] Climate projection data are also made freely available through several international and European projects such as the IPCC, the coordinated regional climate downscaling experiment, the Mediterranean coordinated regional climate downscaling experiment, ENSEMBLE-based predictions of climate changes and their impacts and the climate change and impact research project. To increase the completeness of reporting, the ERT encourages Greece to include the above information in its next NC.

107. In its NC6, Greece did not include information on ongoing initiatives to support developing countries to build capacity in systematic observation. During the review, Greece informed the ERT that the information is contained in chapter 8.1.3 of the NC6; however, this section was unintentionally excluded from Greece's official submission to the secretariat. Greece provided the ERT with chapter 8.1.3, and informed the ERT that it is working with Italy to create a cross-border network for the exchange of data and operational decision management of hydrological and hydrogeological hazards, as well as with the MEDA programme [9] on creating an integrated monitoring system for desertification risk assessment. To increase the completeness of reporting, the ERT encourages Greece to include the above information in its next NC.

108. The ERT notes that Greece did not address the encouragement of the previous review on including information on its current research activities, the results of the latest research on the impacts of climate change and research and development activities regarding mitigation and adaptation technologies. During the review, Greece informed the ERT that the information is contained in chapter 8.2 of the NC6; however, this section was unintentionally excluded from Greece's official submission to the secretariat. Greece provided the ERT with chapter 8.2, and highlighted that table 8.1 provided in its NC6 identifies the main institutions performing research in the sector of climate change in Greece, as well as a list of selected projects related to climate change, the host research institute and web links to additional information. To increase transparency, Greece is encouraged to include this information in its next NC.

## G. Education, training and public awareness

109. In its NC6, Greece has provided information on its actions relating to education, training and public awareness. Compared to its NC5, the Party provided equally extensive information, covering the general policy towards education, training and public awareness; programmes on environmental education; the structure of the educational system; education for sustainable development; cooperation at the national and international level; and educational projects and experimental workshops.

110. In Greece, the responsibility for education and training lies with the Ministry of Education and Religious Affairs, which has incorporated environmental education into its planning and implementation of school activity programmes. Forty-seven environmental education centres are also involved in the implementation of educational programmes and activities. The Ministry of Education and Religious Affairs publishes circulars regarding the planning and implementation of school activities, which include environmental education programmes. Schools also collaborate through thematic networks to organize and support environmental education activities. The Hellenic Association of Teachers for Environmental Education provides support and training, and encourages the exchange of views and coordination between teachers within the framework of environmental education

[8] Available at <www.meteo.gr/meteosearch>.

[9] The MEDA programme is a transnational programme in which Bosnia and Herzegovina, Croatia, Cyprus, France, Gibraltar, Greece, Italy, Malta, Portugal, Slovenia and Spain participate.

activities. Non-educational institutions and research centres, such as the Interdisciplinary Institute for Environmental Research and the Hellenic Association for the Protection of Environment and Cultural Heritage, are also producing educational materials and organizing activities to support continuous education on issues related to climate change.

111. A substantial number of environmental non-governmental organizations are active in environmental education that promote public awareness of specific environmental issues. For example, the Hellenic Society for the Protection of Nature is one of the most active non-governmental organizations in Greece, and is also active in international and national networks regarding environmental education, of which approximately one million students and tens of thousands of educators participate. The ERT notes that Greece did not provide assessments of the impacts and efficacy of public awareness campaigns. Greece may consider, where possible, initiatives to monitor the impact of public awareness campaigns and develop ways of assessing the effectiveness of awareness-raising tools used, and to include this information in its next NC.

112. During the rotating annual Chairmanship of the Human Security Network (HSN), Greece (Ministry of Foreign Affairs) chose to focus its activities on the human security implications of climate change in developing countries. The objective of the Hellenic Chairmanship was to raise, at a global level, awareness on the impacts that changing living conditions can have on peoples' security in developing countries, with a special emphasis on the implications that these circumstances can have on three particularly vulnerable groups, namely women, children and populations fleeing their homes as a result of climate change.

# III. Summary of reviewed supplementary information under the Kyoto Protocol

## A. Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

113. Supplementary information provided by Greece under Article 7, paragraph 2, of the Kyoto Protocol in its NC6 is mostly complete and transparent. The supplementary information is located in different sections of the NC6. Table 9 provides an overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol, as well as references to the NC6 chapters in which this information is provided.

114. Greece has not reported the following elements of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol: an indication of what financial resources provided are considered "new and additional", and in what way these resources are "new and additional" as defined by the Party. During the review, Greece provided this information (see para. 89 above). The technical assessment of the information reported under Article 7, paragraph 2, of the Kyoto Protocol is contained in the relevant sections of this report. The ERT recommends that Greece include this reporting element in its next NC.

Table 9
**Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol**

| *Supplementary information* | *Reference to the sixth national communication* |
|---|---|
| National registry | Chapter 3.4 |
| National system | Chapter 3.3 |
| Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 | Chapter 5.3 |
| Policies and measures in accordance with Article 2 | Chapter 4.3 |
| Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures | Chapter 4.2 |
| Information under Article 10 | Chapters 3.3, 4.1, 4.2, 7.5, 8 and 9 |
| Financial resources | Chapter 7 |

## B. Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol

115. Greece reported the information requested in section II, "Minimization of adverse impacts in accordance with Article 3, paragraph 14", of the annex to decision 15/CMP.1 as a part of its 2014 annual submission. During the review, Greece provided the ERT with the additional information on how it strives to implement its commitments under Article 3, paragraph 14, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention. The ERT, for the 2013 annual review report, found the information in the 2013 NIR generally in line with the supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol (decision 15/CMP.1). However, the ERT recommends that the Party collect information on lands that have temporarily lost forest cover but are not classified as deforested, and apply the IPCC gain–loss method to verify the results of its carbon stock change. Greece has indicated in its 2014 NIR that both issues have been resolved. Therefore, the ERT considers the reported information to be complete and transparent.

116. The 2014 and previous NIRs and the additional information provided during the review presented several initiatives of Greece aimed at minimizing adverse impacts, including the liberalization of the energy market, the establishment of rules for the taxation of energy products and taxes on energy consumption, projects to facilitate and finance the transfer and access of developing countries to environmentally sound technologies, the participation in an EU working group on carbon capture and storage, the participation in the EU Gulf Cooperation Council clean energy network and other projects oriented at the promotion of renewable energies and energy efficiency in developing country Parties.

# IV. Conclusions and recommendations

117. The ERT conducted a technical review of the information reported in the NC6 of Greece according to the UNFCCC reporting guidelines on NCs. The ERT concludes that the NC6 provides a good overview of the national climate policy of Greece. The information provided in the NC6 includes most elements of the supplementary information under Article 7 of the Kyoto Protocol with the exception of some information on financial

resources. During the review, Greece provided additional information on its "new and additional" financial resources, projections methodology, PaMs by sector and by gas, and research and systematic observation activities.

118. Greece's emissions for 2012 were estimated to be 5.8 per cent above its 1990 level excluding LULUCF and 5.2 per cent above including LULUCF. During the period 1990–2000, the increase in GHG emissions was mainly owing to sustained economic growth. Between 2000 and 2007, the annual GHG emission growth rate (approximately 0.5 per cent) was significantly lower than both the annual growth rate of gross inland energy consumption (approximately 1.9 per cent) and GDP annual growth rate (approximately 4.2 per cent). GHG emissions have been decreasing in Greece since 2008, mostly owing to the economic recession.

119. In the NC6, Greece presents GHG projections for the period from 2012 to 2030. Two scenarios are included: 'with measures' and 'with additional measures'. Overall, Greece's reported projections of total GHG emissions for 2020 and 2030 show a decreasing emission trend. Total emissions in 2020 are expected to be at levels that are 0.1 per cent and 1.0 per cent below the 1990 level in the 'with measures' and 'with additional measures' scenarios, respectively. Total emissions in 2030 are expected to be at levels that are 4.5 per cent and 9.6 per cent below the 1990 level in the 'with measures' and 'with additional measures' scenarios, respectively.

120. Based on the comparison of the target and the average annual emissions for the first commitment period (2008–2012), Greece is in a position to meet its Kyoto Protocol target for the first commitment period (limiting its GHG emission growth to 25 per cent compared with the base year level). Greece participates in and contributes to the EU target of 20 per cent emission reduction in 2020 under the Convention and the second commitment period of its Kyoto Protocol. At the time of the review, national targets for EU member States under the second commitment period of the Kyoto Protocol had not yet been decided. Under the Convention target, ETS sectors have an EU-wide emissions cap, and Parties can purchase emission credits to offset GHG emissions. For the non-ETS sectors (excluding LULUCF under the Kyoto Protocol), Greece has a target to reduce GHG emissions by 4 per cent by 2020 compared with the 2005 level. Considering the existing and planned PaMs, Greece expects to meet its non-ETS target.

121. The NC6 contains information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. Greece is not planning to make use of the Kyoto Protocol mechanisms to meet its Kyoto Protocol target.

122. The key frameworks related to climate change and energy in Greece are the second national climate change programme, the EU climate and energy package adopted in 2009, the 2nd NEEAP and NREAP. The second national climate change programme was adopted in 2002 and defines the PaMs necessary for Greece to meet its target for the first commitment period of the Kyoto Protocol, which is limiting the increase of GHG emissions to 25 per cent over the period 2008–2012, compared to base year emissions. Regarding the EU climate and energy package, the main cross-sectoral PaMs contained in the legislation are the EU ETS and the EU ESD, which covers non-ETS sectors. The 2nd NEEAP describes and evaluates the implemented, adopted and planned PaMs for the energy end-use sectors in Greece. NREAP presents PaMs required to achieve Greece's national RES targets, such as the feed-in tariff to incentivize private development of RES.

123. With regard to the most recent financial contributions to enhance the implementation of the Convention by developing countries, Greece provided a cumulative contribution of ODA of USD 2.570 million to multilateral institutions and programmes, as well as through bilateral development cooperation, for 2008–2012. Total ODA (bilateral and multilateral) granted by Greece in 2012 reached USD 327.41 million, which is a

decrease of USD 97.36 million (approximately 23.1 per cent) in relation to 2011 due to Greece's difficult fiscal circumstances. Regarding technology transfer, Greece highlighted its continued involvement and activities within the Mediterranean component of the EU initiative Water for Life, cooperation on environmental protection within the Black Sea Economic Cooperation Organization and the Horizon 2020 initiative on depolluting the Mediterranean.

124. In its NC6, Greece focuses more on vulnerability than adaptation. Greece highlighted that its policy response to adaptation has been improving, although its policy efforts remain concentrated on mitigation actions. In its NC6, Greece included the results of recent studies and projections on the impacts of climate change. Since NC5, Greece has developed a specific framework spatial plan of coastal areas and islands, which includes the impacts of climate change as a consideration in the management of coastal zones. In addition, Greece is in the process of developing a national adaptation strategy, as it is one of the main priorities of MEECC.

125. Regarding research and systematic observation, the General Secretariat of Research and Technology of the Ministry of Education and Religious Affairs, Sport and Culture is the responsible institution for supporting and promoting research in Greece. The General Secretariat of Research and Technology policy framework for research and technological development covers all the main phases of the innovation cycle and is designed to optimize the use of research results, boosting entrepreneurship and supporting start-ups during their initial steps. Funding for the research sector in Greece comes from public and private funds, including funds from the national budget, the programme of public investments, structural funds and the European Commission.

126. Various governmental, professional and non-governmental organizations are involved in environmental information, training and public awareness activities. The Ministry of Education and Religious Affairs publishes circulars regarding the planning and implementation of school activities, which include environmental education programmes. Schools also collaborate through thematic networks to organize and support environmental education activities. Non-educational institutions and research centres, such as the Interdisciplinary Institute for Environmental Research and the Hellenic Association for the Protection of Environment and Cultural Heritage, are also producing educational materials and organizing activities to support continuous education on issues related to climate change.

127. Supplementary information under Article 7, paragraph 1, of the Kyoto Protocol on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol is provided by Greece in its 2013 and 2014 annual submissions.

128. In the course of the review, the ERT formulated several recommendations relating to the completeness and transparency of Greece's reporting under the Convention and its Kyoto Protocol. The key recommendations[10] are that Greece:

(a) Improve completeness of reporting by including in the next NC the following:

(i) Information on what "new and additional" financial resources Greece has provided pursuant to Article 4, paragraph 3, of the Convention and clarification on how it has determined such resources as being "new and additional";

(ii) Table 6 of the UNFCCC reporting guidelines on NCs to report relevant technology transfer activities;

[10] The recommendations are given in full in the relevant sections of this report.

(iii) Information on Greece's activities under the World Climate Programme, the International Geosphere–Biosphere Programme and the IPCC;

(iv) Summary information on Global Climate Observing System activities;

(b) Improve the transparency of reporting by including in the next NC the following:

(i) Information on PaMs by sector and by gas;

(ii) Information under all of the subject headings for PaMs required by the UNFCCC reporting guidelines on NCs;

(iii) Utilization of the same sectoral categories in the PaMs and projections sections;

(iv) Information on which GWPs are used in the preparation of its emission projections;

(v) Information on which PaMs are included in the 'with additional measures' scenario.

## V. Questions of implementation

129. During the review, the ERT assessed the NC6, including supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol and reviewed information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, with regard to timeliness, completeness, transparency and adherence to the reporting guidelines on NCs. No question of implementation was raised by the ERT during the review.

# Annex

## Documents and information used during the review

### A. Reference documents

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications". FCCC/CP/1999/7. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories". FCCC/CP/1999/7. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Decision 15/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>.

"Guidelines for review under Article 8 of the Kyoto Protocol". Decision 22/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>.

"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention". Annex to decision 23/CP.19. Available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a02.pdf#page=20>.

FCCC/SBI/2011/INF.1. Compilation and synthesis of fifth national communications. Executive summary. Note by the secretariat. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf01.pdf>.

FCCC/SBI/2011/INF.1/Add.1. Compilation and synthesis of fifth national communications. Note by the secretariat. Addendum. Policies, measures, and past and projected future greenhouse gas emission trends of Parties included in Annex I to the Convention. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf01a01.pdf>.

FCCC/SBI/2011/INF.1/Add.2. Compilation and synthesis of fifth national communications. Note by the secretariat. Addendum. Financial resources, technology transfer, vulnerability, adaptation and other issues relating to the implementation of the Convention by Parties included in Annex I to the Convention. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf01a02.pdf>.

FCCC/ARR/2013/GRC. Report of the individual review of the annual submission of Greece submitted in 2013. Available at <http://unfccc.int/resource/docs/2014/arr/grc.pdf>.

FCCC/IRR/2007/GRC. Report of the review of the initial report of Greece. Available at <http://unfccc.int/resource/docs/2007/irr/grc.pdf>.

FCCC/IDR.5/GRC. Report of the in-depth review of the fifth national communication of Greece. Available at <http://unfccc.int/documentation/documents/advanced_search/items/6911.php?priref=600006290>.

Sixth national communication of Greece. Available at <http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/nc6_greece%5B1%5D.pdf>.

2013 GHG inventory submission of Greece. Available at <unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/grc-2013-nir-16apr.zip>.

2014 GHG inventory submission of Greece. Available at <unfccc.int/files/national_reports/annex_i_ghg_inventories/inventory_review_reports/application/zip/grc-2014-nir-15apr.zip>.

## B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Georgios Zisis-Tegos (Ministry for the Environment, Energy and Climate Change), including additional material on updated policies and measures, greenhouse gas projections, the national registry and recent climate policy developments in Greece. The following documents[11] were also provided by Greece:

Viglione, A., M. Borga, et al. (2010). "Barriers to the exchange of hydrometeorological data in Europe: Results from a survey and implications for data policy." Journal of Hydrology 394(1–2): 63-77.

Ministry of Environment, Energy and Climate Change. 2011. 2nd National Energy Efficiency Action Plan.

National Energy Balance. 2014. Electricity imports and exports.

Centre for Renewable Energy Sources, and National Technical university of Athens. Incorporating Grid Expansion Calculation Algorithms in the TIMES model, for improved Operation under wide-scale RES Penetration.

Energy Systems Analysis Laboratory, and Centre for Renewable Energy Sources and Savings. Generation Expansion Planning under Wide-Scale RES Energy Penetration.

[11] Reproduced as received from the Party.